

# Self-regulation in pre-service teacher training

## Conference or Workshop Item

# SELF-REGULATION IN PRE-SERVICE TEACHER TRAINING
# ΑΥΤΟΡΡΥΘΜΙΣΗ ΣΤΗΝ ΕΚΠΑΙΔΕΥΣΗ ΕΚΠΑΙΔΕΥΤΙΚΩΝ

ARMAKOLAS STEFANOS, SKLIVA PARASKEVI, MIKROYANNIDIS ALEXANDER, ZOTOS CHRISTOS

The meaning of the term self-regulated learning (SRL) could be summed up with the phrase "learn how to learn". It's a dynamic and creative procedure, according to which learners set goals of their own, while trying to direct, regulate and monitor ways of achieving those. At the same time, the contribution of Information and Communications Technologies (ICT), especially in recent years, is quite important in the field of adult education. This study focuses on applying SRL methods on adult educators-to-be with the assistance of modern ICT. The process takes place in a blended learning environment, where traditional education techniques meet distance education, and spans across two semesters of getting acquainted with a variety of ICT tools and platforms (Microsoft PowerPoint, Windows Movie Maker, Google Sites, Concept Maps, Webquest). With that in mind, we'll investigate the parameters that affect self-regulation and the strategies each future educator develops while going through the already established learning process. For the purposes of our study, we conducted a research by putting together and handing out to our target group a digital questionnaire. The analysis of the survey's outcome brings to light several positive remarks. Apparently, all involved ICT tools contribute, some in greater and some in lesser length, towards regulating the learning process of the educators-to-be, improving eventually their self-efficacy.

**Keywords:** self-regulated learning (SRL), adult education, distance education, blended learning, Information and Communications Technologies (ICT)

## 1 ADULT EDUCATION

Several definitions have been proposed from times to times in order to describe the field of adult education. The Organisation for Economic Co-operation and Development (OECD) mentions in 1977: "Adult education encompasses any learning activity or program, purposely designed by an education authority in such a way so, that it is be able to satisfy certification needs or those of typical interest and that may arise in any stage of a person's life that has surpassed the age of mandatory learning and therefore their main focus is on activities, other than sole education. Hence its scope encapsulates, non-professional, professional, general, typical and non-typical studies, as well as the part of education that serves a social purpose" (Rogers, 1999).

This study aims to determine the effect of SRL in adult education, by taking under consideration the contribution of ICT. Its purpose was deemed advisable, not just because it brings up some rather interesting topics (adult education, self-regulated learning, information and communication technologies), but also, due to the fact that, it's a necessity to further look into a matter that's not been discussed into detail by both Greek and Foreign literature.

## 1.1 BLENDED ADULT LEARNING

Blended or hybrid learning combines face-to-face education with the one taking place over the internet (Distance Learning), aiming to reduce the time a student is required to spend and be physical present in a traditional classroom (Dziuban et. al., 2004). That synergy is achieved by having one approach complementing the other, by filtering out just the positive effects from each one of them (Ginns & Ellis, 2007).

# 2 SELF-REGULATED LEARNING

Self-regulated learning (SRL) is a field of great scientific interest. Many researchers have, over the years, tried to come up with detailed and structured ways that students could adopt in their learning process, in order for them to eventually be the ones that are in control of it.

According to Schunk & Zimmerman (1998), SRL is defined as "the learning process that is conceptualized on a greater scale by the effect of the learners' self-produced thoughts, emotions, strategies and even behaviors, all aligned towards achieving their set goals". Two years later, Pintrich (2000) elaborates that "SRL is a dynamic and constructive procedure, under which students set their own learning goals, while at the same time attempt to direct, adjust and control ways of reaction that are defined or limited by said goals and possible environmental conditions".

Thus, self-regulated learning, the meaning of which could be described with the phrase "learn how to learn", focuses on one's self, as it is the students themselves that are responsible for directing their learning process, by setting goals, and monitoring and adjusting their behaviors in order to achieve those.

## 2.1 SELF-REGULATED LEARNING MODELS

A range of different SRL models have been proposed over the time that try to analyze and interpret its specific mechanisms. Two of them are those of Zimmerman and Pintrich, both of which share several common characteristics. What follows is the description of said models, prior to their integration into the purposes of the current study.

### 2.1.1 THE ZIMMERMAN MODELS

Zimmerman, was one of the first researchers that dealt with SRL. His work led to the development of three distinguished models that describe the different phases of self-regulated education. The "Cyclical Phases of SRL" are outlined in the second model that he came up with, presenting on an individual level the connection between the procedure of metacognition and that of incentives. This model was first introduced to the scientific community in 2000, including at the time all of the different phases that it consists of, as well as each one's of those subprocesses. In 2009 the model underwent some amendments, part of which several newly designed metacognitive strategies during the performance phase.

The first phase refers to planning, or in other words the procedures and the beliefs one has to take under consideration prior to the beginning of the learning process. The student analyzes the task in hand, s/he evaluates any existing personal experience and already gained knowledge, sets and prioritizes her/his goals and plans

on how to achieve them, as well as goes through a series of motivational beliefs (incentives) that tend to trigger her/his learning strategies.

The second phase of Zimmerman's model refers to the conduction of the learning process itself. The learner carries out his plan while, at the same time, monitors its progression, using a series of self-control strategies. Those aim to make her/him feel motivated enough to pursue the cognitive goals s/he has set.

The third phase is that of self-reflection and it refers to the procedures taking place after the learning process is over. It is during this phase that the learner reflects upon the quality of her/his learning experience (be it successful or a failure), leading to self-reactions of positively or negatively approaching her/his task (self-reward or self-punishment). The flow of SRL in this model is cyclical, meaning that the self-reflection that took place in all previous learning attempts, affects any subsequent procedures that may come later with the next planning phase (Panadero, 2017).

### 2.1.2 THE PINTRICH MODEL

The model Pintrich came up with in 2000 provides a general and concise theoretical background for SRL. It consists of four phases that do not take place in linear or hierarchical orders and that, in any case, cannot affect one another. Each one of those phases involves the triggering of four possible internal procedures (SRL areas). This combination of phases and areas offers a complete picture of the entire approach, including a series of SRL processes that take place all throughout it (Table 1). Additionally, Pintrich contributed greatly in the field of SRL by putting together a helpful tool in the form of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et. al., 1993; Duncan & McKeachie, 2005).

| **Conceptual Framework for Self-Regulated Learning** | | | | |
|---|---|---|---|---|
| | **Areas for Regulation** | | | |
| **Phases** | **Cognition** | **Motivation / Affect** | **Behavior** | **Context** |
| **1.** Forethought, planning and activation | Goal Setting | Value and Interest Assessment | Time and Effort Planning | Perception of Task |
| **2.** Monitoring | Cognition Monitoring | Motivation and Affect Monitoring | Effort Monitoring | Condition Monitoring |
| **3.** Control | Strategy Learning | Motivation and Affect Strategies | Increase / Decrease Effort | Task Change or Renegotiation |
| **4.** Reaction and reflection | Attributions | Attributions | Choice | Task Evaluation |

**Table 1: The Pintrich Model (Source: Panadero, 2017)**

## 3 INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)

The term Information and Communication Technologies (ICT) refers to a wide range of available digital technologies that deal with the management and transmission of digital information over communication networks and more specifically over the Internet (Dimitriades, 2015). Several definitions have been appointed over the years to ICT. The most recent of those comes from UNESCO (2007) and claims that "the term ICT refers to the technology utilized to transmit, store, process, develop, present, share or exchange information by electronic means. This broad definition for ICT includes technologies like the radio, the television, the telephone, satellite systems, computer hardware and software, as well as any devices or services that may possibly be affiliated with all aforementioned technologies, like teleconferencing, the email and blogs" (Meleisea, 2007).

### 3.1 THE PRESENCE OF ICT IN ASPETE'S EPPAIK PROGRAM

The students of the School of Pedagogical and Technological Education (ASPETE) in Patras, Greece, who participate in the Pedagogical Certification program (EPPAIK), attend two semesters of Lab courses, throughout which they are tasked to complete several activities / assignments (Table 2) with the help of an array of ICT tools.

| Course | Semester | Assignment | ICT Tools |
|---|---|---|---|
| Educational Technology & Multimedia | Winter | Presentation | Microsoft PowerPoint |
| | | Video | Windows Movie Maker |
| | | Website | Google Sites |
| Pedagogical Aspects of the Computer | Spring | Concept Map | Inspiration |
| | | WebQuest | OpenWebQuest |

**Table 2: The ICT tools that the survey will focus on**

These courses focus on the pedagogical benefits of educational / learning strategies and relevant technological tools, the aim of which is to ensure that the educators-to-be are capable to creatively incorporate ICT into the subjects they have been assigned to teach. Classes take place in a blended learning environment. Concerning the aspect of in-person learning, the educator is tasked to present the theoretical aspects of the topic in discussion, the ICT tool that is to be utilized for each assignment, the requirements related to the technical specifications, the evaluation criteria, as well as the expected results her/his students have managed to achieve after each individual teaching section has successfully wrapped up. Meanwhile, it's important to hold meaningful discussions that focus on providing feedback and giving answers to any questions that may possibly exist. In regards to distance learning now, ASPETE performs it through the Open eClass platform[1].

[1] https://www.openeclass.org/

## 4 LITERATURE REVIEW OF SIMILAR STUDIES

Yot-Domínguez & Marcelo (2017) conducted research in order to investigate whether or not university students of the Andalusian area make good use of digital technologies when it comes to planning, organizing and facilitating their learning process. The outcome of said research showed that even though the students seemed to constantly use ICT in their everyday lives, it was on the other hand apparent that they didn't actually take advantage of it into regulating their learning experience. Out of all the technologies that were studied in the research, those used for searching for information on the Internet and instant web communication looked to be the ones utilized the most. However, this was a case by case scenario as student behavior appeared to be different in regards to how each one of them approached ICT and the frequency with which they did so. A final conclusion, stemming out from this particular study, noted that university professors should be in favor of SRL, by offering their students opportunities to discover the usefulness of digital technologies, while encouraging the incorporation of those in the learning process.

Armakolas et al. (2015) looked into the parameters that contribute towards effective learning, and which appear to be present in a self-regulated approach, with the help of an online distance learning platform. The results of their research proved that distance learning environments contribute positively in the learning process, as well as SRL itself. However, those cannot be generalized towards a larger population or other distance learning systems, due to the circumstances under which the research was undertaken and the diversity that portrayed the layered sample.

Mikroyannidis et al. (2014) investigated SRL in formal education by examining the perceptions of educators, classifying the challenges associated with SRL and identifying opportunities for promoting SRL within different cultural settings. For this purpose, a survey was developed as an instrument of collecting quantitative and qualitative data from educators in a number of countries inside and outside Europe. The analysis of this data has provided an insight into the perceptions of educators about SRL, their strategies for motivating SRL among their students, as well as the challenges they face in motivating SRL.

Valentín et. al. (2013) examined: a) the connection between the different uses of ICT and learning performance, as well as b) that between learning strategies and the incentives originating from the engagement with ICT. Their data showed that there's a wide variety of ICT tools that students take advantage of in their studies: from software used to design educational multimedia, to web browsers or even communication tools, which, as expected, seem to be used more often than the rest. Moreover, the results of this study demonstrate four distinct aspects of ICT: 1) the social, 2) the technical, 3) the academic and 4) that of the educational platform. In conclusion, the researchers claimed to have found a pattern between motivation and knowledge acquisition that is based on the need of students to develop metacognitive skills. That desire exists, in the hope that it will allow them to incorporate their newfound knowledge into the regulation of their learning experience.

Alexiou & Paraskeva (2010) considered the possibility of implementing an e-portfolio on the educational process in order to increase the interest of students in SRL and, by extension, the further development of their academic and professional skills. According to this study, the e-portfolio's structure was responsible for improving the engagement of students with its platform, leading to promotion of learning in general. At the same time, the procedure of shaping this e-portfolio as a learning strategy, could

may as well be utilized for enhancing SRL itself. Finally, the researchers presented two of the most significant limitations that they came across in their work, with the first being the small population of their sample and the second, the functionalities of the tool they proposed and used as part of their study.

Carneiro (2006) followed up on the impact of a Technology Enhanced Learning Environment (TELE) could have on educator SRL. The most important findings of his work are as follows:

- Professional upgrowth appears to be the incentive that motivates educators the most to participate in the program.
- The program's curriculum was deemed to be more attractive and accessible, due to the flexibility that modern technology brings to the learning process.
- TELE's most popular characteristic, among the participant trainees, proved to be that of social learning.
- The incentive timetable could be described as a U curve, upon which the initial enthusiasm gives its place to instant disappointment, followed by a tendency for «persistence» that is connected to further reinforcement of future goal management. That last part in specific is stated by Carneiro to come with the development of improved skillsets.

## 5 RESEARCH

### 5.1 PURPOSE OF THE STUDY AND RESEARCH QUESTIONS

Purpose of this study is to determine the parameters of SRL in adult education, using ICT tools. The research that was conducted involved graduates of ASPETE'S EPPAIK program in Patras, and concerns activities / assignments that those were tasked to complete during the two semester period of their studies.

The study focuses on the following research questions:

1. Which are the motives that encourage learners to participate more actively in the process of SRL?
2. Which are the most suitable methods to apply in order to ensure the highest standards possible for the learners' self-regulation?

### 5.2 RESEARCH METHOD

The present study is designed and implemented based upon a literature review that was conducted, focusing on educational research (Cohen et al., 2007). Upon further investigation, it was concluded that the method to be used for the purposes of the study's research segment, would fall under the inquiring – descriptive type and more specifically the one category that is referred to as a "small-scale survey".

### 5.3 RESEARCH TOOL

The research tool used to gather all required data is that of the questionnaire. That is a very widely spread and practical tool utilized to collect information for the purposes of a survey. Among its benefits are: the ability it has to offer numeric, in many instances,

data, the fact that it can be distributed without the physical presence of the researcher being mandatory, as well as the intuitive and easy to approach method of analysis that it culminates in (Wilson & McLean, 1994). The questionnaire was the tool that was deemed to be the most suitable for this particular research, as it: a) preserves the total anonymity of the survey's participants, allowing them to openly think and express their opinion, b) collects information from a large number of trainees in a short period of time, c) allows the quantification of the data and d) offers the ability to perform statistical analysis and comparisons.

#### 5.3.1 STRUCTURE OF THE QUESTIONNAIRE

The structured questionnaire consists of three segments: the follow-up letter, demographics (6 questions) and the research questions (12 questions, out of which 11 are closed-ended and 1 is open-ended).

The formation of the questionnaire relied on the SRL models developed by Zimmerman and Pintrich respectively, with both being widely recognizable and sharing several similarities, as well as on relative literature (Yot-Domínguez & Marcelo, 2017; Armakolas et al., 2015; Valentín et. al., 2013; Alexiou & Paraskeva, 2010; Carneiro, 2006). In Pintrich's case, the influence that is provided concerns those questions that deal with incentives, and which are adjusted to fit the purposes of the current research. The questionnaire was put together online using Google Forms. In order to attract interest, it was shared on relevant Facebook groups, as well as via e-mail with the graduates.

### 5.4 SAMPLING

The research's quality does not depend solely on how suitable the method selected for its purpose is or the choice of the appropriate tools, but also the determination of the right sampling method. The sample of this research in particular consisted of current and previous students of ASPETE'S EPAIK program in Patras. The sample was defined using the method of "convenient" sampling, which can be commonly found taking place in small-scale surveys. Convenient sampling is performed by picking those people located in close proximity to the researcher and utilizing them as subjects that assist and participate in the continuation of the research process, until the required sample size is covered (Cohen et al., 2007). In total, 62 questionnaires were filled in between 04/02/2019 and 12/02/2019, all of which make up for the sample of the present research.

## 6 DATA ANALYSIS – RESULT PRESENTATION

### 6.1 DEMOGRAPHICS

What follows is the general profile – individual characteristics of the survey's participants, as a result of data analysis performed on the demographic information that they provided.

- The majority of the sample consists of female population.
- The age groups with the highest percentages of participation are «26-30», «31-35» and «36-40», which cumulatively constitute the 80,7% of the sample.

- The majority of the sample has a high level of educational attainment, as they are Master's degree owners.
- Half of the entire sample's population are graduates in exact sciences or polytechnic studies.
- Most of the sample is employed or partially employed.
- The participants that do not have any professional experience as educators, are more than those that do.

## 6.2 SELF-REGULATED LEARNING IN ADULT EDUCATION

The analysis of the results took place in regards to the reasons the survey's participants decided to attend the EPPAIK program, as well as their motivations or, in other words, what persuades them to achieve the most out of their participation in the Lab's courses, in order to regulate their learning.

When asked which are the main reasons that made them interested in participating in ASPETE's EPPAIK program (Table 3) the participants, even if they could choose between seven different options, they simply focused on two of them. In particular, the majority of the sample, rising up to 75,8%, bring up professional reasons and 24,2% of them, personal matters.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Professional | 47 | 75,8 |
| Social | 0 | 0,0 |
| Family | 0 | 0,0 |
| Personal | 15 | 24,2 |
| Economic | 0 | 0,0 |
| Pastime | 0 | 0,0 |
| Other | 0 | 0,0 |
| Total | 62 | 100,0 |

**Table 3: Main reasons for participating in ASPETE's EPPAIK program**

Apropos whether or not the Lab's courses are of interest to them (Table 4), 88,7% agree, 8,1% stand neutral, and just 3,2% of the participants disagree.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Strongly Disagree (1) | 1 | 1,6 |
| Partially Disagree (2) | 1 | 1,6 |
| Neutral (3) | 5 | 8,1 |
| Partially Agree (4) | 21 | 33,9 |
| Strongly Agree (5) | 34 | 54,8 |

| | | |
|---|---|---|
| Total | 62 | 100,0 |
| **Average Value: 4,39** (between Partially Agree and Strongly Agree) | | |

**Table 4: Interest in the Lab's courses**

Similar results emerge from the analysis of the data given as an answer to the next question, regarding whether or not participants gain personal growth over the period of time they attended the Lab's courses (Table 5). Once again, the vast majority here agreed with a percentage of 87,1%, when 9,7% is neutral, and 3,2% disagrees.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Strongly Disagree (1) | 1 | 1,6 |
| Partially Disagree (2) | 1 | 1,6 |
| Neutral (3) | 6 | 9,7 |
| Partially Agree (4) | 25 | 40,3 |
| Strongly Agree (5) | 29 | 46,8 |
| Total | 62 | 100,0 |
| **Average Value: 4,29** (between Partially Agree and Strongly Agree) | | |

**Table 5: Lab courses offer personal growth**

In regards to what satisfies participants the most in trying to comprehend the Lab's courses in-depth (Table 6), 37,1% responded that they strongly agree, 35,5% agree partially, both of which percentages cumulatively constitute the 72,6% of the subjects, 25,8% are neutral, and just 1,6% state disagreement.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Strongly Disagree (1) | 0 | 0,0 |
| Partially Disagree (2) | 1 | 1,6 |
| Neutral (3) | 16 | 25,8 |
| Partially Agree (4) | 22 | 35,5 |
| Strongly Agree (5) | 23 | 37,1 |
| Total | 62 | 100,0 |
| **Average Value: 4,08** (between Partially Agree and Strongly Agree) | | |

**Table 6: What satisfies me the most in Lab courses is trying to comprehend them in-depth, as difficult as they might be**

When it comes to implementing concepts and knowledge acquired from the Lab's courses in other activities, like in e.g. conversations, other courses etc. (Table

7), 79% agrees, 14,5% is neutral, and a small percentage in the range of 6,4% disagrees.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Strongly Disagree (1) | 1 | 1,6 |
| Partially Disagree (2) | 3 | 4,8 |
| Neutral (3) | 9 | 14,5 |
| Partially Agree (4) | 26 | 41,9 |
| Strongly Agree (5) | 23 | 37,1 |
| Total | 62 | 100,0 |
| **Average Value: 4,08** (between Partially Agree and Strongly Agree) | | |

**Table 7: I'm trying to implement concepts and knowledge that I acquired from the Lab's courses, in activities outside of it**

Concerning whether aiming for good performance in the Lab's Courses matters a lot for the participants in order to prove their capabilities to family, friends, employers, etc. (Table 8), the majority of them disagrees with a percentage as high as 48,4%. At the same time, a 24,2% is neutral and 27,4% agrees with the statement.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Strongly Disagree (1) | 16 | 25,8 |
| Partially Disagree (2) | 14 | 22,6 |
| Neutral (3) | 15 | 24,2 |
| Partially Agree (4) | 8 | 12,9 |
| Strongly Agree (5) | 9 | 14,5 |
| Total | 62 | 100,0 |
| **Average Value: 2,68** (between Partially Disagree and Neutral) | | |

**Table 8: Performing well in the Lab's courses matters a lot in order to prove my capabilities to others**

Finally, when asked if they aim to acquire more knowledge from the Lab's courses, in order to find a better job (Table 9), 56,4% of those asked agree, 30,6% is neutral and a small percentage in the range of 12,9% disagrees.

| Choices | Frequency | Percentage (%) |
|---|---|---|
| Strongly Disagree (1) | 3 | 4,8 |
| Partially Disagree (2) | 5 | 8,1 |
| Neutral (3) | 19 | 30,6 |
| Partially Agree (4) | 25 | 40,3 |
| Strongly Agree (5) | 10 | 16,1 |
| Total | 62 | 100,0 |
| **Average Value: 3,55** (between Neutral and Partially Agree) | | |

**Table 9: I'd like to acquire more knowledge from the Lab's courses, because that would provide me a better working position**

## 6.3 SELF-REGULATED LEARNING AND ICT

The most important hurdles the trainees had to face while dealing with the Lab's assignments are presented right up next (Table 10). The total number of responses in this question is 70, since, just for this particular instance, the survey's participants were eligible to select more than one option.

| Choices | Frequency |
|---|---|
| Lack of Time | 56 |
| Lack of Theoretical Comprehension | 9 |
| Inadequacy in using a Computer | 0 |
| Inadequacy in utilizing ICT Tools | 3 |
| Other | 2 |
| Total | 70 |

**Table 10: Most important hurdles**

Furthermore, the open-ended question that was part of the questionnaire and actually concluded the survey was rather important as well. It dealt with ways the trainees had to come up with, in order to overcome any obstacles that perhaps arose during the semesters. The responses of the participants, this time around, pretty much coincided with one another. In general though, they focus on the skillsets the trainees were required to develop in order to be in a position to regulate their learning experience and that is exactly the reason these responses in particular are of great value.

A few examples of those described skills are as follows: a) more optimal organization / time management, b) additional effort, will and discipline, c) the ability to look up information from various sources and d) the cooperation with other students, as well as the assistance from the professor's side, in order to be able to successfully complete assignments (social skill).

## 7 CONCLUSIONS – FUTURE RESEARCH

Several important conclusions emerge from the conducted research, however those cannot be generalized towards a larger population or even all blended learning systems that deal with adult education. That is due to the nature of the program itself (training educators-to-be), as well as the sample's small size and the lack of diversity in its layers.

The main reasons that led the trainees to attend the EPPAIK program are apparently professional (employment prospects / professional upgrowth), followed by the more personal ones (self-growth / interests). When it comes to their motivation concerning participation in the Lab's courses, it can be concluded that it is the internal incentives (personal interest, usefulness of the course's subject, the need to acquire in-depth knowledge in order to further improve their self-growth, development of metacognitive skills) the ones that end up motivating them in greater length. On the contrary, external incentives seem to affect them in a much lesser extent, as trainees do not find it important to prove their skills to others. However, as it was already stated, they mainly aim towards having a better work position, hence them joining and wanting to complete the EPPAIK program after all.

The most suitable methods / skills the trainees utilized in order to achieve the most optimal SRL, are apparently the following: a) improved organization / time management, b) additional effort, will and discipline, c) the ability to look up information from various sources and d) the cooperation with other students, as well as the assistance from the professor's side, in order to be able to successfully complete assignments.

Out of everything mentioned in this study, it can be concluded that the utilization of the specific ICT tools that took part in the conducted research, contributed, some in greater and some in lesser extent, towards the improvement of learning regulation in adult education.

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## Contact

Dr Stefanos Armakolas
Department of Education
School of Pedagogical & Technological Education (ASPETE)
+302610461412
E-mail: armakolas@aspete.gr